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(54) Title: DISPLAY DEVICE			
(57) Abstract			
<p>A display device (30), particularly for use as a menu board in a restaurant or the like. The device (30) has at least two rotatable roller members (31 or 32) located in substantially parallel spaced apart relationship. Carrier means (38) is provided, tightly supported by and rotatable about the rollers (31 and 32) and adapted to receive at least one display means (36) thereon. Each of the carrier means (38) and said display means (36) are constructed at least partially of substantially flexible and translucent material. Illumination means (37) are provided behind at least a portion of said carrier means (38), to illuminate a viewing portion of said carrier means (38) and said display means (36) thereon. Most preferably, each display means (36) is sized and shaped to fit between a pair of adjacent rollers such that one or more discrete rest position(s) is/are automatically identified after said display device (30) is rotated, whereby, in said rest position(s), one of said display means (36) is centrally positioned between a respective pair of rollers (31 and 32).</p>			

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DISPLAY DEVICE

TECHNICAL FIELD

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The present invention relates to a display device, and in particular, to a rotating display device, particularly suitable for, but not limited to, a rotating menu board for use in a fast food restaurant.

10 BACKGROUND OF THE INVENTION

Menu boards used in fast food outlets are typically positioned at more than two meters above ground level, usually behind and/or above the serving counter, or, in a driveway - for a drive-through service. The difficulty encountered with utilising such 15 menu boards is that they are difficult and cumbersome to change, due to their size and position.

Also, in some fast food outlets, two or more menus are often utilised throughout the day, for instance, at breakfast or at lunch and/or dinner. With such prior art menu boards, fast food outlets with two or more menus typically show both their menus 20 throughout the entire day. This causes delays, confusion and misordering by customers, when looking at the wrong menu.

Various rotating menuboards have herebefore been designed, to overcome these problems, such as described in Australian Patent No. 640211 by Florida Plastics Midwest, Inc. AU 640211 describes a rotatable display sign which has a circular-like member 56 25 (Fig. 7) with a plurality of recessed portions around the circumference thereof. A plurality of rigid panel portions 34 which are interconnected on their longitudinal edges by hinge-like means. The hinge-like means 40,41 engage the recessed portions 58 such that, when a handle 62 is manually operated, the drum like member 56, via a gearing arrangement 55, facilitates movement of the display sign panels 34.

30 As will be appreciated, the device of AU 640211 is quite difficult to manufacture due to its vast number of components, is cumbersome to operate due to the necessity to turn handle 62 - which may typically be positioned some two metres above ground level, and is prone to breakage - due to its complex design and incorporation of many moving

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parts.

SUMMARY OF THE INVENTION

5 The present invention seeks to provide a display device which overcomes the disadvantages of the prior art.

The present invention also seeks to provide a display device which enables the alternative positioning of a display means between, a viewing position, and one or more 10 storage position(s), such that, different displays can be provided at different predetermined times throughout the day, etc.

In one broad form, the present invention provides a display device, comprising: at least two rotatable roller members located in substantially parallel spaced apart 15 relationship;

a carrier means, tightly supported by and rotatable about said rollers and adapted to receive at least one display means thereon, each of said carrier means and said display means being constructed at least partially of substantially flexible and translucent material; and,

20 illumination means, provided behind at least a portion of said carrier means, to illuminate a viewing portion of said carrier means and said display means thereon.

In a most preferred form, each display means is sized and shaped to fit between a pair of adjacent rollers such that one or more discrete rest position is/are automatically 25 identified after said display device is rotated, whereby, in said rest position(s), one of said display means is centrally positioned between a respective pair of rollers.

30 Preferably, the display device is embodied wherein said carrier means is a belt, band, or the like, rotatable about each of said roller members.

30 Alternatively, but also preferably, the display device may be embodied wherein said carrier means extends between is adapted to roll onto at least two of said roller members, in a spool-like manner.

In a preferred form said carrier means is formed of a lightweight polycarbonate or like plastics material, such as 'LEXAN'.

5 Preferably, said display means comprises translite(s) and/or slat(s).

In a preferred form said translite(s) is/are attached to said carrier by a substantially transparent/translucent adhesive material.

10 In an alternatively preferred form of the invention said translite(s) is/are attached to said carrier by a covering sheet provided over substantially the entirety of said carrier, such that each translite is positioned between said carrier and said covering sheet.

15 In an alternatively preferred form said translite(s) is/are attached to said carrier by a hook and loop fastening system, such as Velcro.

Preferably, each said slat(s) is attached to said carrier by slat carrier means.

20 Preferably, each said slat carrier means has a lip thereon to support an edge of a respective slat.

Preferably, each slat may optionally be provided with at least one window portion therein, and wherein an indicia module may be provided behind said window.

25 In a preferred form each indicia module comprises:
at least one substantially translucent carrier to removably house an indicia card;
at least one attachment means to attach said indicia module to said slat carrier means.

30 Preferably, said attachment means comprises at least one protrusion on the edge of each module, adapted to be retained by said slat carrier means.

In a preferred embodiment the display device further comprises drive means, to

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drive at least one of said roller members and to thereby selectively move at least one display means between a viewing position and a storage position(s).

In one version, said drive means continuously moves said carrier means.

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In a further broad form, the present invention provides an alternative version said drive means is operated intermittently, to move one of at least two display means to said viewing position, one at a time.

10 An indicia module for use with a display device having slat carriers or the like, comprising:

a module frame, sized and shaped to fit between a pair of slat carriers; and

display window means intermediate said module frame, for selectively and removably inserting display indicia therein;

15 characterised in that said module is provided with at least one protrusion forming an attachment means such that resistance to sliding of said module along said slat carrier is effected.

BRIEF DESCRIPTION OF THE DRAWINGS

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The present invention will become more fully understood from the following detailed description of the preferred but non-limiting embodiment described in connection with the accompanying drawing, wherein:

25 Fig. 1 shows, in Fig. 1(a) a schematic perspective view of a preferred embodiment of the display device of the present invention, and, in Fig. 1(b), a preferred embodiment of such a display device within a housing;

Fig. 2 shows, in Figs. 2(a) to 2(f) thereof, various schematic views of alternative 30 roller arrangements useful for the invention;

Fig. 3 shows, in Figs. 3(a) to 3(d) thereof, various details of a preferred embodiment of the invention wherein a plurality of slats, held by a suitable slat carrier

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means, form the display device; and,

Fig. 4 details in Figs. 4(a) to 4(c) thereof an indicia display capsule utilised with the embodiment of Fig. 3.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in Fig. 1, a display device 30 comprises a pair of rotatable roller members 31 and 32 located in parallel spaced apart relationship. A carrier means 33 is 10 mounted between the roller members 31 and 32, in a belt like manner. It may either rotate in the direction of arrow 34, the direction of arrow 35, or, in both directions 34 and 35, one at a time. Rotation of the carrier may be effected either manually, or by drive means, which is not shown in the drawings. The drive means may either drive one or both of the roller members 31 and 32 to thereby selectively move the carrier means 33. 15 The carrier means 33 is adapted to receive at least one display means 36 in a removable manner thereon. Preferably, the embodiment depicted in the drawing will be provided with at least two display means 36 thereon, one on the "front" of the display device 30, and one on the rear of the display device 30. By operation of the drive means, the display means 36 may be selectively moved between a viewing position and a storage 20 position. That is, the viewing position will be at the front of the display device, and the storage position will be at the rear of the display device.

Lights or other illumination means 37 are provided between the roller members 31 and 32 to illuminate the display means 36 when in the viewing position. This is achieved by constructing the carrier means 33 and the display means 36 at least partly of 25 transparent and/or translucent material or the like, such that the light can shine therethrough.

As shown in Fig. 1(b), the display device 30 may be provided in a housing 39 - the housing 39 being intended to be provided in an overhead position behind a serving counter in a restaurant, bar, shop or the like. It will be appreciated that, by installing 30 the device 30 in such a housing 39, the device 30 faces a person in front of the counter.

As hereinbefore mentioned, the display means is removably attached to the carrier means by any known means, for example, by a substantially transparent or translucent adhesive material such as used for window stickers, etc, or by other known means which

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permits easy placement and removal such a velcro, sticky tapes, or the like. The display device may either be used to alternatively, intermittently or continuously, display two or more display means 36, by intermittently or continuously rotating the rollers 31 or 32, or, by an electric/electronic drive means, to move one of at least two display means to

5 a viewing position, one at a time. This may, for example, be useful for displaying at least two menus, one at a time, in a fast food restaurant, whereby one menu is to be displayed during breakfast, and another menu is to be displayed during lunch or dinner at predetermined times. For example, the menus could be changed at 10.00 am when it is desired to cease displaying the breakfast menu and thereafter display the lunch menu.

10 The display device may be operated such that the drive means causes the breakfast menu to be moved from the front to the rear of the display device such that the lunch menu is thereafter displayed.

Suitable control circuitry may be provided to automatically affect this operation, or, the drive means may be manual, or be operated by a switch, electrical
15 component/circuitry or the like.

One of the features that makes the display device of the present invention different from the display devices of the prior art, is the material of which the display device belt 38 is fabricated. This belt, or carrier means, is, in accordance with the present invention, constructed of a substantially flexible and translucent material. That is, the carrier means
20 or belt is preferably constructed of a plastics or other polycarbonate material such as "LEXAN". This allows the belt to stretch between the pair of rollers 31 and 32 and rotate thereabout. The use of such a material allows easy hand movement of the display device, unlike the prior art device, such as shown in Australian Patent 640211, which requires a cumbersome operation of a handle. The use of such a polycarbonate material
25 such as LEXAN also has translucent characteristics allowing the illumination means 37 to shine therethrough. An extremely useful characteristic feature of using such a tightly provided but lightweight belt about the rollers, is that "self-alignment" is achieved, as will be described in more detail hereinafter.

As mentioned hereinbefore, either a single transparency 36 or a plurality of slat
30 like members may be positioned in the outline shown by reference numeral 36. It will be appreciated that a further transparency or set of slat like members would also be provided on the back surface of the belt 38. Obviously, when in use as a display sign, there is no sign attached to the curve portions or end portions of the overall device, i.e.

the portion about the rollers 31 and 32. Consequently, a unique effect of the invention results. That is, due to natural balancing effects, automatic alignment of the display portions occurs to 'rest positions', such that a display is either provided on the front or back surface, but does not tend to stop halfway between the front and back and about the 5 rollers 31 or 32. This is facilitated by the combination of lightweight materials for the belt and a smooth rolling action of the rollers 31 and 32.

As mentioned hereinbefore, a single transparency can be supplied on to each of the front and back surfaces of the belt 38, such as within the dotted lines shown by reference numeral 36 in Fig. 1. A variety of means can be utilised for attaching a single 10 transparency, such as glues, velcros, tapes, etc.

Alternatively, a plurality of slat holders may be supplied on to the belt, such that slats may be easily inserted therein.

Such a slat arrangement is shown in Fig 3, Fig. 3(a) illustrating a front view thereof, and Fig. 3(b) illustrating an elevational view thereof. Details of a particular slat 15 is illustrated in front view and elevational view in Figs. 3(c) and 3(d). The slats slide into the slat carriers, as will be understood, behind a lip provided along each edge of the carriers.

In Fig. 4 is shown an indicia display capsule, useful for use with the slat arrangement of Figs. 3. Front and elevational views are shown in Figs. 4(a) and 4(b). 20 By this unique design of the indicia display capsule, indicia may be easily inserted into the capsule as shown in Fig. 4c, and then, due to the provision of unique protruding portions 40, the capsule may be easily inserted into position and held therein between pairs of slats. Consequential sliding in or out of the slats over the capsule does not result in movement of the capsule. Such a module may be useful in display devices other than 25 that shown in the drawings.

It will be appreciated by persons skilled in the art that numerous variations and modifications will become apparent.

For example, as it will be appreciated by persons skilled in the art, depending on the number of display message required, variations to the device, with differing numbers 30 of rollers, can be made. Examples of such variations are shown in Fig. 2. Fig 2 shows the use of a plurality of single size rollers in Figs. 2(a), 2(b) and 2(c), the use of smaller diameter rollers - in Figs. 2(d) and 2(e) - which enable a 'longer' viewing area on the front of the display device, and, the use of rollers wherein the carrier may roll onto the

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rollers - in Fig. 2(f). Such an embodiment of Fig. 2(f) may be particularly useful where space constraints are defined.

These and all other variations and modifications which become apparent to persons skilled in the art should however be considered to fall within the scope of the invention as broadly hereinbefore described and as broadly claimed.

THE CLAIMS

1. A display device, comprising:
 - at least two rotatable roller members located in substantially parallel spaced apart
 - 5 relationship;
 - a carrier means, tightly supported by and rotatable about said rollers and adapted to receive at least one display means thereon, each of said carrier means and said display means being constructed at least partially of substantially flexible and translucent material; and,
- 10 illumination means, provided behind at least a portion of said carrier means, to illuminate a viewing portion of said carrier means and said display means thereon.
2. A display device as claimed in claim 2, wherein each display means is sized and shaped to fit between a pair of adjacent rollers such that one or more discrete rest 15 position(s) is/are automatically identified after said display device is rotated, whereby, in said rest position(s), one of said display means is centrally positioned between a respective pair of rollers.
3. A display device as claimed in claim 1 or 2, wherein said carrier means is a belt, 20 band, or the like, rotatable about each of said roller members.
4. A display device as claimed in claim 1 or 2, wherein said carrier means extends between is adapted to roll onto at least two of said roller members, in a spool-like manner.
- 25 5. A display device as claimed in any one of claims 1 to 4, wherein said carrier means is formed of a lightweight polycarbonate or like plastics material, such as 'LEXAN'.
- 30 6. A display device as claimed in any one of claims 1 to 5, wherein said display means comprises translite(s) and/or slat(s).
7. A display device as claimed in any one of claims 1 to 6, wherein said translite(s)

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is/are attached to said carrier by a substantially transparent/translucent adhesive material.

8. A display device as claimed in any one of claims 1 to 7, wherein said translite(s) is/are attached to said carrier by a covering sheet provided over substantially the entirety 5 of said carrier, such that each translite is positioned between said carrier and said covering sheet.

9. A display device as claimed in any one of claims 1 to 6, wherein said translite(s) is/are attached to said carrier by a hook and loop fastening system, such as Velcro.

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10. A display device as claimed in any one of claims 1 to 9, wherein each slat may optionally be provided with at least one window portion therein, and wherein an indicia module may be provided behind said window.

15 11. A display device as claimed in any one of claims 1 to 10, wherein each said slat carrier means has a lip thereon to support an edge of a respective slat.

12. A display device as claimed in any one of claims 1 to 11, wherein each slat may optionally be provided with at least one window portion therein, and wherein an indicia 20 module may be provided behind said window.

13. A display device as claimed in any one of claims 1 to 12, wherein each indicia module comprises:

25 at least one substantially translucent carrier to removably house an indicia card;
at least one attachment means to attach said indicia module to said slat carrier means.

14. A display device as claimed in any one of claims 1 to 13, wherein said attachment means comprises at least one protrusion on the edge of each module, adapted to be 30 retained by said slat carrier means.

15. A display device as claimed in any one of claims 1 to 14, wherein the display device further comprises drive means, to drive at least one of said roller members and to

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thereby selectively move at least one display means between a viewing position and a storage position(s).

16. A display device as claimed in any one of claims 1 to 15, wherein said drive means continuously move said carrier means.

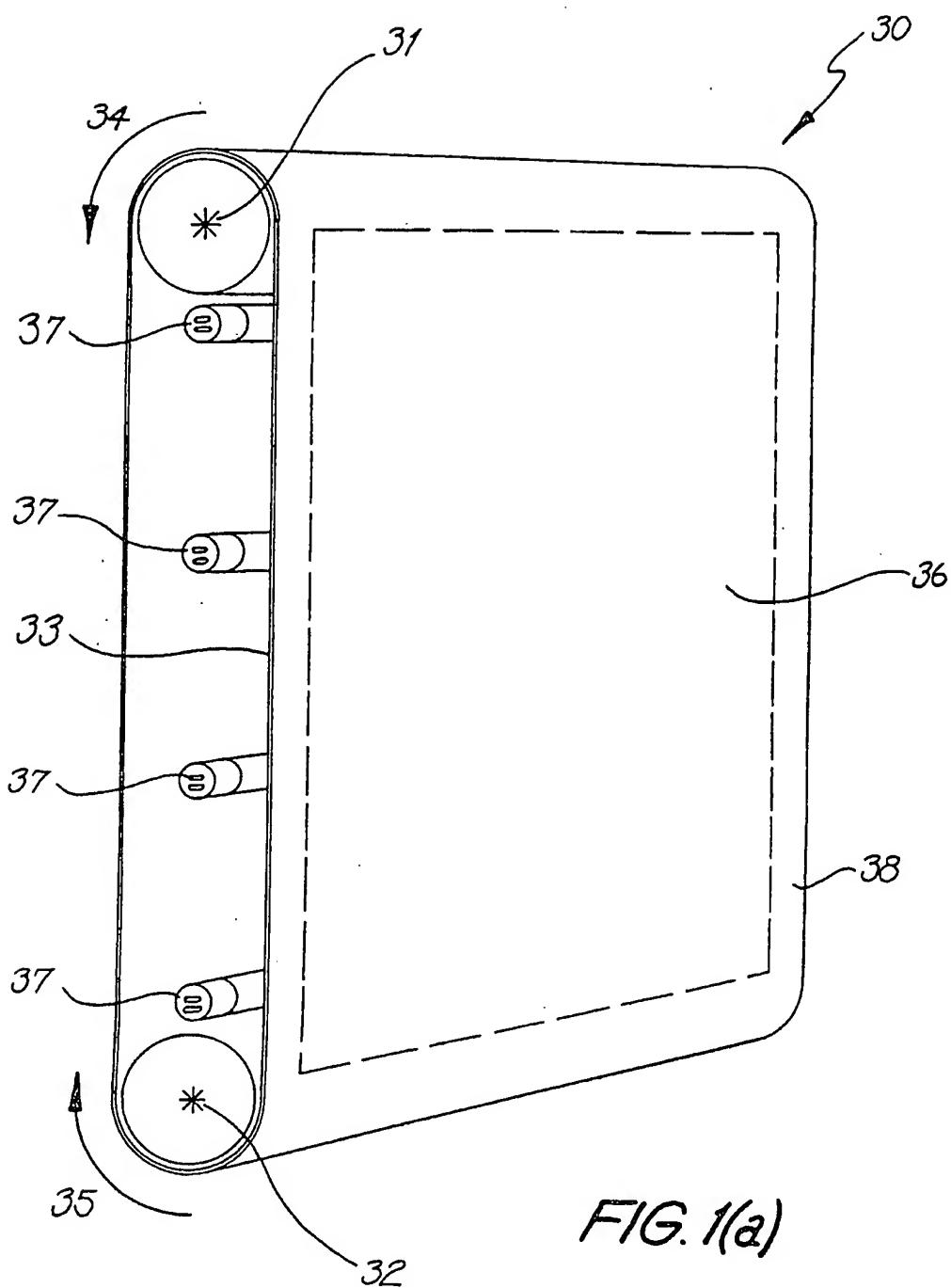
17. A display device as claimed in any one of claims 1 to 16, wherein said drive means is operated intermittently, to move one of at least two display means to said viewing position, one at a time.

10

18. An indicia module for use with a display device having slat carriers or the like, comprising:

15 a module frame, sized and shaped to fit between a pair of slat carriers; and display window means intermediate said module frame, for selectively and removably inserting display indicia therein; characterised in that said module is provided with at least one protrusion forming an attachment means such that resistance to sliding of said module along said slat carrier is effected.

20 19. A display device and/or an indicia module substantially as herein before described with reference to the accompanying drawings.



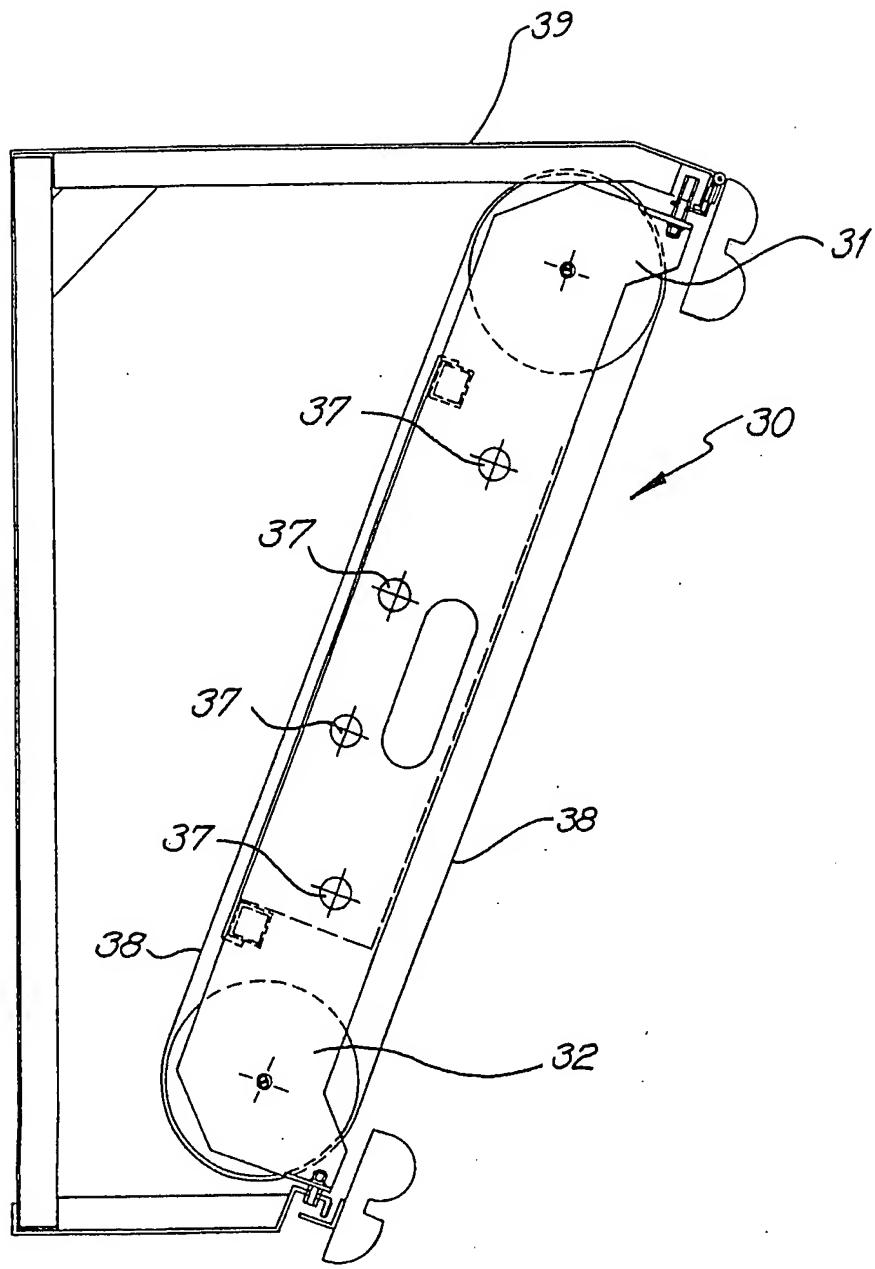


FIG. 1(b)

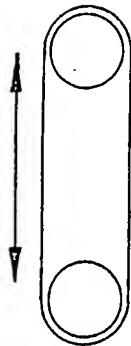


FIG. 2(a)

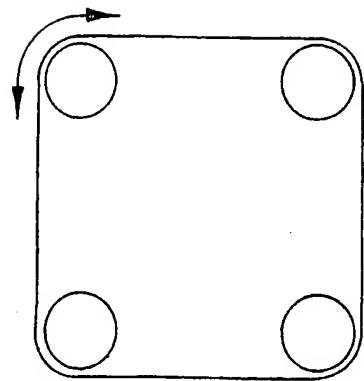


FIG. 2(b)

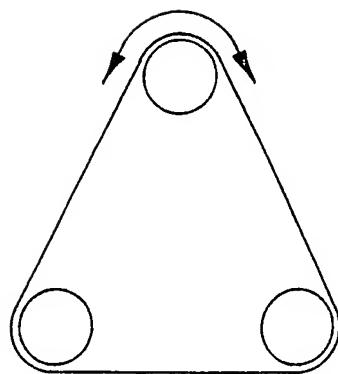


FIG. 2(c)

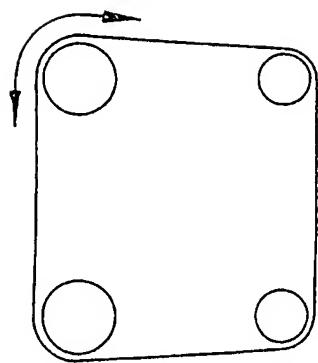


FIG. 2(d)

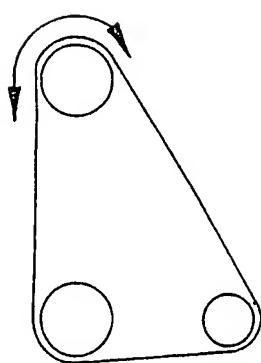


FIG. 2(e)

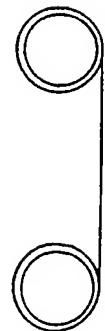


FIG. 2(f)

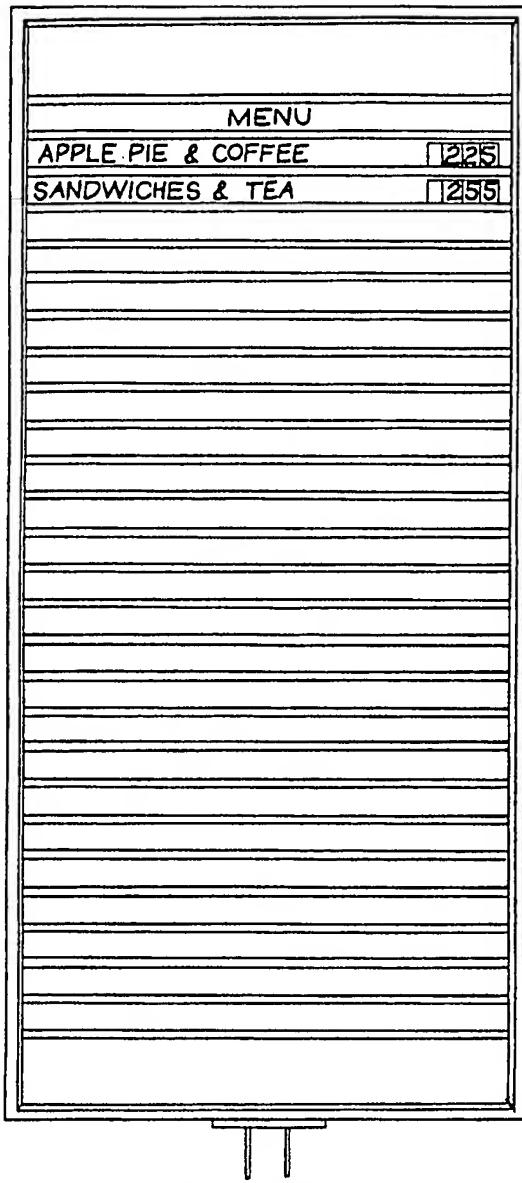


FIG. 3(a)

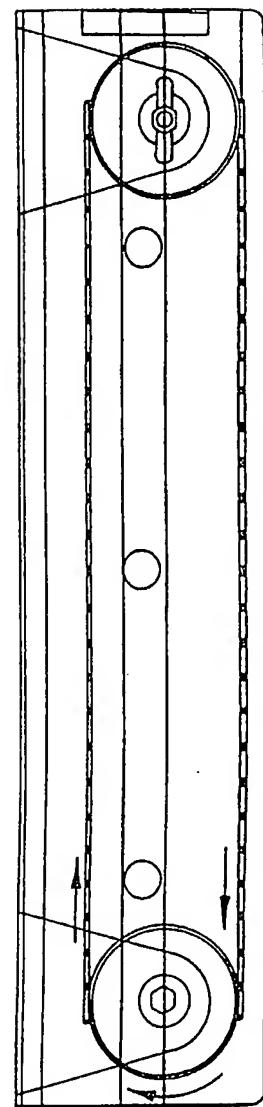


FIG. 3(b)

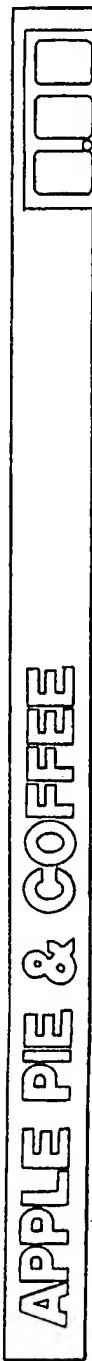


FIG. 3(c)



FIG. 3(d)

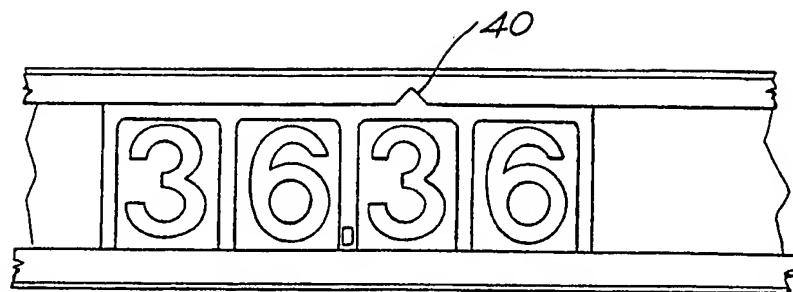


FIG. 4(a)

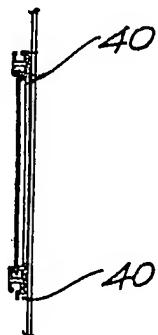


FIG. 4(b)

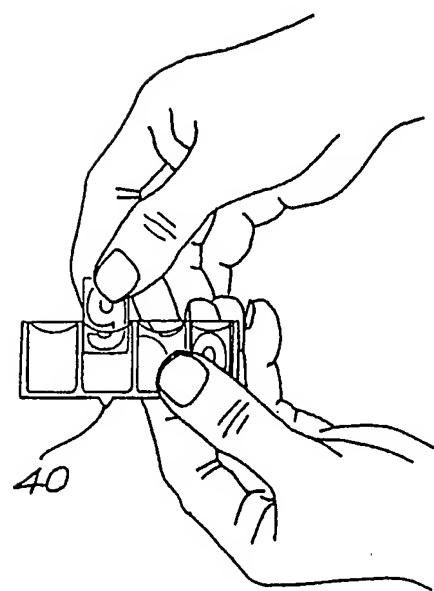


FIG. 4(c)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 94/00278

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.⁶ G09F 11/24, 13/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC : G09F 11/24, 11/26, 11/29, 13/04, 13/08Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU : IPC as above

Electronic data base consulted during the international search (name of data base, and where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
P,X	DE,A, 4202068 (TRAUTWEIN GMBH & CO) 29 July 1993 (29.07.93) See the whole specification	1-4
X	DE,A, 3901053 (MARJANOVIC) 19 July 1990 (19.07.90) See the whole document	1-5
A	US,A, 5207011 (COULTHARD) 4 May 1993 (04.05.93) See column 2, line 66 to column 3, line 51	18
A	DE,A, 4000109 (MARJANOVIC) 11 July 1991 (11.07.91) See the whole specification	

 Further documents are listed
in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
 "E" earlier document but published on or after the international filing date
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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
 "&" document member of the same patent family

Date of the actual completion of the international search
12 September 1994 (12.09.94)

Date of mailing of the international search report

15 Sept 1994 (15.09.94)

Name and mailing address of the ISA/AU

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU 94/00278

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate of the relevant passages	Relevant to Claim No.
A	US,A, 4817316 (WALKER) 4 April 1989 (04.04.89) See column 1, line 66 to column 3, line 15	18
A	FR,A, 2576128 (WORLD ACRILUX SA) 18 July 1986 (18.07.86) See page 3, line 13 to page 4, line 28	
A	US,A, 4461107 (GRATE) 24 July 1984 (24.07.84) See column 2, line 49 to column 4, line 10	18
A	US,A, 4430819 (CHANDLER) 14 February 1984 (14.02.84) See the Abstract	
A	FR,A, 2377071 (ROUSSEL) 4 August 1978 (04.08.78) See the whole specification	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 94/00278

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international search report has not established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim Nos.: 19 because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

Claim 19 is not drafted in accordance with Rule 6.2(a).

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Claims 1 to 17 are directed to a display device consisting of at least two rollers, a carrier means and an illumination means.

Claim 18 is directed to an indicia module consisting of a frame and a display window.

It is self-evident that a technical relationship does not exist between the inventions, as defined in PCT Rule 13.2. Accordingly, the international application does not relate to one invention or to a single inventive concept.

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU 94/00278

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report	Patent Family Member
WO 9008374	DE 3901053
EP 412138	JP 3503324
END OF ANNEX	